

RIVERS AND FLOODS

By H. C. FRANKENFIELD

There were no floods during the month of January, except in the rivers of the South Atlantic and east Gulf systems, but in these the floods were marked. In the Apalachicola and Altamaha systems of Georgia and Florida the river stages exceeded any previous records and the floods were attended by loss of life and the destruction of a great amount of property. A detailed discussion of these floods would be interesting, but in the interest of economy of space the details will be summarized in a brief general description, with the usual table of statistics following at the end of this report.

There were two flood periods in the rivers of the Carolinas. The first was a moderate one resulting from some heavy rains during December 31, 1924, and January 1, 1925, but before the rivers could recede to normal conditions, a second period of heavy rains set in, beginning January 9 and continuing until January 19 with, however, an intermission of three days from January 13 to 15, inclusive. The rainfall for this period is shown in the table immediately following:

Rainfall in inches, January 9 to 20, inclusive, 1925

River and station	Dates										Total
	9	10	11	12	13	16	17	18	19	20	
Roanoke:											
Randolph, Va.		0.78	1.25	1.15	0.05	0.12	0.35	0.03		0.45	4.18
Weldon, N. C.	T.	T.	0.48	1.18	0.78		0.46	0.53	0.14	1.13	4.70
Tar:											
Rocky Mount, N. C.		0.64	1.22	0.67			0.59	0.36	0.12	1.25	4.85
Tarboro, N. C.	0.02	0.58	1.27	0.50	T.		0.65	0.26	0.12	1.00	4.40
Greenville, N. C.		0.75	1.31	0.62			0.57		0.38	1.07	4.70
Neuse:											
Neuse, N. C.		0.35	1.06	0.92	0.04		0.72	0.60	0.12	1.04	4.85
Smithfield, N. C.	0.03	0.76	0.92	0.41	0.02		0.80		0.58	1.10	4.62
Cape Fear:											
Fayetteville, N. C.		1.15	1.10	0.58			0.94	0.18	0.53	1.01	5.49
Elizabethtown, N. C.		0.12	1.32	0.68			0.86	0.40	1.08	0.98	5.44
Haw:											
Moncure, N. C.	T.	0.58	0.47	0.59	0.01		0.78	0.54	0.35	1.00	4.32
Waccamaw:											
Conway, S. C.	0.18	0.10	0.90	0.61		0.13	1.76	0.55	1.18	0.35	5.76
Peedee:											
Cheraw, S. C.		0.58	1.63	0.12			1.32	0.42	0.82	0.53	5.72
Mars Bluff, S. C.		0.20	1.00	0.40			1.47	0.60	1.87	1.22	6.76
Lynches:											
Effingham, S. C.		0.15	1.25	0.57		0.16	1.80	0.85	1.50	1.20	7.48
Black:											
Kingstree, S. C.	0.15	0.05	1.70	0.20			1.80	0.50	1.75	0.70	6.85
Catawba:											
Mount Holly, N. C.	T.	0.78	0.84	1.86		0.22	1.00	0.48	0.74	0.74	6.66
Catawba, S. C.	T.	1.25	0.85	0.45			1.13	0.61	0.51	0.91	5.71
Wateree:											
Camden, S. C.	0.10	0.37	2.05	1.30	0.05	0.25	1.55	1.33	1.25	2.50	10.75
Broad:											
Blairs, S. C.	0.05	0.64	0.86	0.51		0.20	1.28	0.88	1.31	1.24	6.97
Saluda:											
Pelzer, S. C.	0.32	1.62	2.02	0.64		0.22	1.04	1.06	0.96	0.74	8.62
Chappels, S. C.		0.47	1.60	0.23		0.55	1.25	1.15	1.12	1.16	7.53
Congaree:											
Columbia, S. C.	0.03	0.21	1.37	0.85		0.58	1.48	1.18	1.38	2.37	9.45
Santee:											
Rimini, S. C.		0.15	1.10	0.65		0.65	1.45	1.90	2.15	1.85	9.90
Ferguson, S. C.	0.32	0.13	0.81	1.01		0.33	2.04	0.87	1.13	0.96	7.60
Broad:											
Carlton, Ga.	0.35	0.48	1.40	0.40		0.45	1.88	2.75	1.10	0.50	9.31
Savannah:											
Calhoun Falls, S. C.	0.06	0.48	1.32	0.36	0.06	0.78	1.56	1.89	1.00	0.54	8.03
Augusta, Ga.	0.02	0.08	1.79	0.57		0.41	2.53	2.25	1.95	1.89	11.49
Oconee:											
Milledgeville, Ga.	0.05	0.38	3.19			1.60	1.93	2.87	1.94	0.30	12.26
Dublin, Ga.	0.19	0.69	2.97	0.43		1.05	2.44	0.43	3.56	1.45	13.21
Ocmulgee:											
Macon, Ga.	0.16	0.60	3.28	0.17		1.65	2.06	2.97	1.95	0.06	12.90
Hawkinsville, Ga.	0.07	1.38	4.52	0.57		1.80	2.75	0.83	3.35	0.53	15.80
Abbeville, Ga.	0.04		3.75	0.25		0.85	1.75	0.16	2.25	1.48	10.53
Lumber City, Ga.	0.30		0.75	0.35		0.80	0.55	0.65	2.45	1.75	7.30
Flint:											
Woodbury, Ga.	0.20	0.28	2.10			3.20	0.90	2.80	1.00		10.48
Montezuma, Ga.	0.19	0.96	5.22	0.48		1.05	1.94	1.06	1.67	0.17	12.74
Albany, Ga.	0.35	0.01	4.30	0.45		0.41	1.75	0.90	3.05	0.36	11.58
Bainbridge, Ga.	0.66		0.35	0.31				0.02	2.45	0.48	4.27
Chattahoochee:											
Norcross, Ga.	0.55	1.06	2.92	0.23		0.95	0.77	2.82	1.01	0.17	10.48
West Point, Ga.	0.46	0.62	2.58			3.57	0.76	2.79	0.62	0.17	11.57
Columbus, Ga.	0.13	0.44	4.55	0.06		2.80	2.18	1.52	1.54	0.12	13.34
Enola, Ala.	0.30	3.62	3.38			2.24	2.10	2.95	2.16	0.10	16.85
Alaga, Ala.	0.07		1.59			0.26	2.23	1.46	1.61		7.22

Rainfall in inches, January 9 to 20, inclusive, 1925—Continued

River and station	Dates										Total
	9	10	11	12	13	16	17	18	19	20	
Apalachicola:											
Blountstown, Fla.	2.00		0.57	(1)	(1)	(1)	(1)	(1)	2.50		
Etowah:											
Canton, Ga.	0.97	0.98	1.59	0.12		0.67	0.82	2.65	1.04	0.19	9.03
Oostanaula:											
Resaca, Ga.	0.96	1.20	0.75	0.10	0.03	0.60	T.	1.45	1.00	0.40	6.49
Rome, Ga.	T.	1.89	0.82	0.60	0.10	0.79	0.51	2.20	1.11	0.30	8.32
Coosa:											
Gadsden, Ala.	1.79	0.76	0.97			0.70	0.63	1.77	1.07	0.30	7.99
Lock No. 4, Lincoln, Ala.	0.65	0.62				1.04	2.01	1.37	0.04		5.73
Wetumpka, Ala.	0.30	0.90	2.05			2.00	0.40	2.05	0.80	0.25	8.75
Tallapoosa:											
Milstead, Ala.	0.15	1.35	1.80			4.40	0.50	1.75	0.65	0.12	10.72
Cahaba:											
Centerville, Ala.	0.13	0.39	0.88	0.02		1.66	1.47	5.24	0.51	0.02	10.32
Alabama:											
Montgomery, Ala.	0.30	0.96	1.77	T.		4.32	0.86	2.41	1.04	0.15	11.81
Selma, Ala.	0.30	0.39	1.72	0.04		3.40	0.48	2.97	0.95		10.25
Black Warrior:											
Lock No. 10 Tuscaloosa, Ala.	0.73	0.45	0.62			1.10	0.50	2.29	0.78	0.02	6.49
Tombigbee:											
Columbus, Miss.	3.10	2.49	0.65			0.52	1.80	1.90	0.45	T.	10.91
Lock No. 4, Demopolis, Ala.	0.26	1.20	1.52	0.05		2.20	0.67	3.20	0.33		9.43
Chickasawhay:											
Enterprise, Miss.	1.12	1.36	0.36			2.00	1.23	2.52			8.59
Shubuta, Miss.	1.05	1.00	1.10			2.25	1.30	2.90	0.10		9.70
Leaf:											
Hattiesburg, Miss.	0.02	1.12	1.70			4.80	1.52	2.25	0.07		11.48
Pascagoula:											
Merrill, Miss.		0.56	0.86			3.72	1.04	3.66	0.22		10.06
Pearl:											
Edinburg, Miss.	0.17	2.08	0.83			1.04	1.65	2.28	0.18		8.21
Jackson, Miss.	0.20	2.50	0.95			1.45	1.35	1.50			7.95
Monticello, Miss.	0.30	1.23	1.82			4.68	1.95	4.06			14.04
Columbia, Miss.	0.10	0.66	1.12			5.51	0.96	2.78			11.13
Bogue Chitto:											
Franklinton, La.		0.92	1.53			2.85	1.70	1.70			8.70
West Pearl:											
Pearl River, La.		0.42	1.28			3.54	0.62	1.40	0.06		7.32

T=Trace of precipitation.

1 Incomplete.

The inevitable result of such a protracted period of heavy rains was floods that affected the entire South Atlantic and east Gulf drainage areas except the Florida Peninsula, and the region of maximum flood occurrence closely coincided with the region of heaviest rainfall, namely central and southern Georgia and southern Alabama. In the rivers of North Carolina and eastern South Carolina the floods were relatively not severe, with the Cape Fear floods in the forefront.

The floods in the Santee and Savannah River systems attained somewhat greater proportions with a corresponding increase in loss and damage. No definite figures were received for the Savannah River, but the lowlands were overflowed on the South Carolina side of the river, submerging railroad properties, business establishments, and small houses, and the operation of cotton and other mills, and railroad traffic was suspended for a few days. The crest stage at Augusta, Ga., on January 20, 36.5 feet, or 4.5 feet above the flood stage, with the present levee, was equal to a stage of about 35.6 feet without levee protection, a fact that must be taken into consideration in computing flood crests for the swamps and lowlands below Augusta.

The floods in the rivers of the Altamaha system were the greatest of record and the losses and damage were of every imaginable character. Lumber, livestock, bridges, railroad tracks, and houses were carried downstream. Levees were broken; lumber, brick, and stock yards were overflowed, highways covered, and traffic of all kinds completely demoralized. In Telfair County it was reported that virtually all bridges were covered by the raging waters. At Milledgeville, Ga., on the Oconee River, the crest stage of 36.7 feet on January 19 was 14.7

feet above flood stage and 2.9 feet above the previous high water of March 17, 1912, while at Macon, Ga., on the Ocmulgee River the crest of 27.5 feet on the same date was 9.5 feet above the flood stage and 2.2 feet above the previous record of December 11, 1919. Similar reports were received from all other stations on these two rivers and from the Altamaha River which carried their combined flow. The automobile highway between Brunswick and Darien, Ga., across the 5-mile delta of the Altamaha River, was covered by water from 3 to 4 feet in depth. Over an area 15 miles in width many towns were completely surrounded by water, 500 or 600 people were marooned for days, and thousands of cattle, sheep, and hogs were drowned in the low flat country.

In the Flint, Chattahoochee, and Apalachicola Rivers conditions similar in character prevailed, but in the Flint River, at least, they were in intensified form, the second flood closely following the first. Enormous areas of lowlands in central and southern Georgia and portions of northwestern Florida were covered with water, causing excessive damage of every description and total demoralization of industry. The town of Newton, Ga., the county seat of Baker County, on the lower Flint River, was completely submerged, and other towns and villages were surrounded by water for days, necessitating relief by the American Red Cross. In the Flint River below Montezuma, Ga., the crest stages were several feet higher than ever before, with the greatest excess of 5 feet at Bainbridge, Ga., near the mouth of the river. In the Chattahoochee the crest stages, while very high, were not unprecedented except in the vicinity of Alaga, Ala., where there was a slight increase over the previous high-water mark. In the Apalachicola River, however, which is the confluent stream, the crest stages were from 4 to 7 feet higher than ever before recorded.

The floods in the upper Coosa River and its tributaries were not severe, but in the lower Coosa and the Tallapoosa and in the Alabama, the confluent stream, the crest stages were from 7 to more than 18 feet above the flood stage, the excess occurring in the Alabama River. However, the high stages were several feet below extreme high-water marks.

There was a moderate flood in the Black Warrior River of Alabama and in the Tombigbee River at and below the mouth of the Black Warrior, with resulting overflow of river bottoms but without great loss of property.

The floods in the Pascagoula and Pearl system of Mississippi were also moderate, although the losses were rather heavier than in the State of Alabama.

Warnings of all these floods were issued as soon as the first reports of heavy rains were received, and continued daily and sometimes more frequently until the waters began to subside, and it is gratifying to state that over all the area covered by the flood waters there were only two casualties, two young men having been drowned while boating on Flint River in the vicinity of Albany, Ga. It has been impossible to obtain anything more than very rough and incomplete estimates of the amount of loss and damage and of the amount of property saved through the flood warnings. Such figures as were obtainable are given in the table below:

Statement of losses by floods and savings through warnings
[Not including figures for railroad property and highways]

State	Losses			Savings through warnings
	Miscellaneous	Crops and live-stock	Suspension of business	
North Carolina.....	\$25,000		\$35,000	\$30,000
South Carolina.....	213,250	\$12,865	63,060	281,925
Georgia (Altamaha).....	1,750,000	750,000		
Georgia (Apalachicola system).....	367,000	15,000	50,000	300,000
Georgia-Alabama (Alabama).....	18,975	4,980	3,590	49,000
Alabama (Tombigbee).....	10,000	4,730		33,700
Mississippi.....	57,750	30,000	53,000	39,000
Total.....	2,441,975	817,575	204,650	733,625
Grand total of losses.....		3,464,200		

It will be seen from the above table that by far the greatest losses occurred in the drainage area of the Altamaha system, and it should be stated also that the table does not include losses over the Savannah drainage area and to railroads generally. In addition many observers reported the saving of thousands of head of cattle which were driven from the lowlands onto higher ground upon receipt of the flood warnings, and no value has been placed upon these.

Expressions of commendation from the press, commercial organizations, corporations, and individuals were numerous, and were appreciative as well of the saving of life and property as of the accuracy of the flood warnings. Under date of January 26, 1925, the Montgomery, Ala., Advertiser stated:

It has been estimated by a prominent State official that special efforts of the local weather bureau in assembling data and issuing warnings during the recent flood crisis, were the means of saving \$1,000,000 to citizens in river territories of middle and south Alabama.

Letters from commercial and other organizations were equally commendatory.

At the close of the month flood conditions were developing in the Willamette River of Oregon and report thereon will be made in the MONTHLY WEATHER REVIEW for February, 1925.

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
ATLANTIC DRAINAGE					
Roanoke:	<i>Feet</i>			<i>Feet</i>	
Randolph, Va.-----	21	12	13	23.3	13
Weldon, N. C.-----	30	2	4	34.7	3
		12	16	40.0	14
Tar:					
Rocky Mount, N. C.-----	9	13	15	9.5	14
		21	22	9.0	21, 22
Tarboro, N. C.-----	18	14	19	21.3	17
		21	27	20.9	24
Greenville, N. C.-----	14	14	28	16.0	18
Neuse:					
Neuse, N. C.-----	15	2	4	16.8	4
		11	16	18.0	14
		19	23	16.8	20, 22
Smithfield, N. C.-----	14	2	6	16.3	5
		12	25	18.1	14, 22
Cape Fear:					
Fayetteville, N. C.-----	35	2	2	36.5	2
		12	14	42.1	13
		20	23	43.9	21
Elizabethtown, N. C.-----	22	2	5	28.0	3
		12	26	31.8	22